June 8, 1965 A. P. GIULIANO 3,187,465

HOLLOW BLOCK WALLS FOR BUILDINGS AND CONSTRUCTION BLOCKS FOR MAKING SUCH WALLS

Filed May 15, 1963

FIG. 1

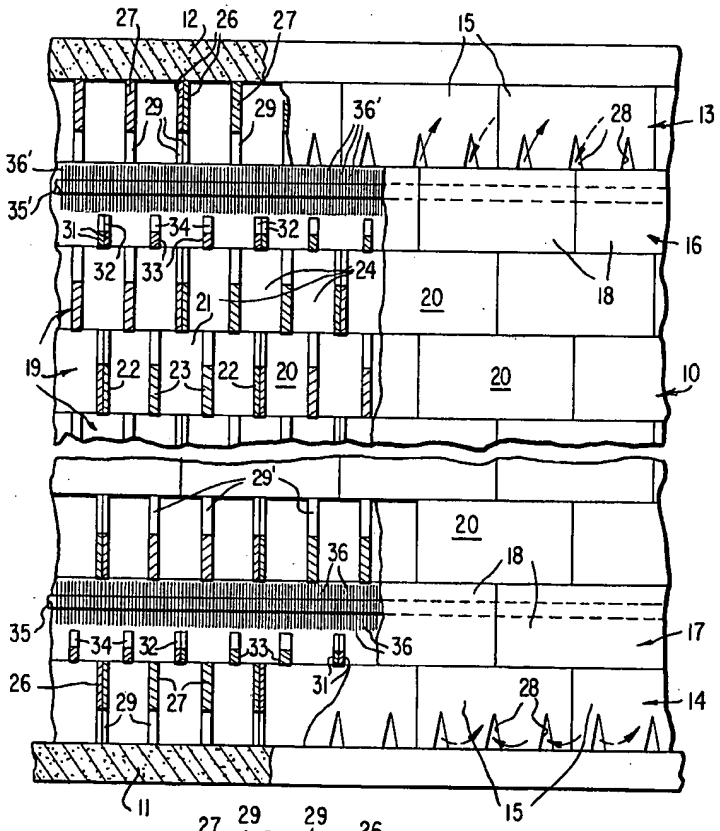


FIG. 2

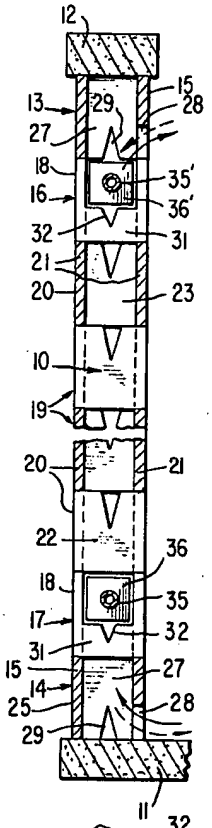


FIG. 3

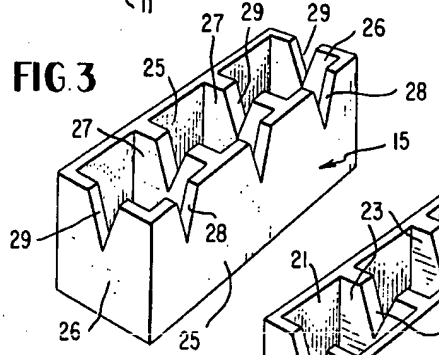


FIG. 4

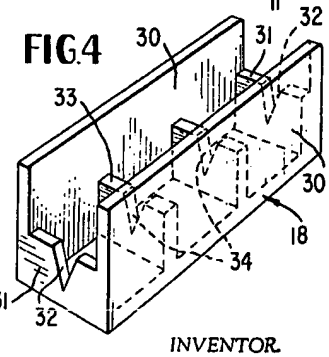
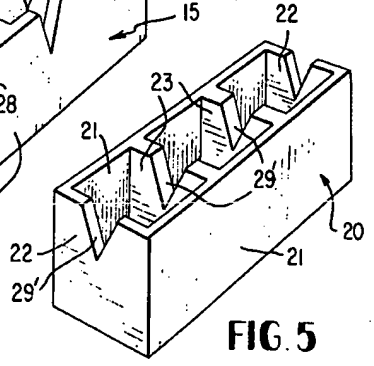


FIG. 5



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HOLLOW BLOCK WALLS FOR BUILDINGS AND CONSTRUCTION BLOCKS FOR MAKING SUCH WALLS

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This invention relates to hollow block walls for buildings and to construction blocks for making such walls.

More specifically, the invention is concerned with ventilated building walls constructed with improved ventilating building blocks, said walls adapted to contain simplified means for heating or cooling enclosure areas surrounded by the walls embodying the invention.

An object of the invention is to provide hollow construction blocks having ventilating opening means allowing air to circulate vertically horizontally and laterally through the blocks and through wall structures erected with the blocks.

Another object of the invention is to provide simplified heating, cooling and ventilating means for walls constructed with hollow blocks, so that a building or enclosure need not be equipped with auxiliary inside or outside heating, cooling or ventilating apparatus; the invention therefore saving a great amount of space in commercial buildings, factories, etc. and also greatly reducing the costs incident to heating, cooling and ventilating.

Another object is to provide a heating, cooling and ventilating wall structure which is very easy to erect with heating and cooling means therein and which is economical and constitutes a substantially permanent trouble-free installation when proper materials are used.

Other objects and advantages of the invention will be apparent during the course of he following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

FIGURE 1 is a fragmentary side elevational view, partly in section of a wall structure embodying the invention,

FIGURE 2 is a typical vertical section through the wall structure of FIGURE 1,

FIGURE 3 is a perspective view of a ventilating block embodying the invention and utilized in the wall structure,

FIGURE 4 is a perspective view of another ventilating block embodying the invention and utilized in the wall structure of the invention, and

FIGURE 5 is a perspective view of another block utilized in intermediate courses of the wall construction according to the invention.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 10 designates generally a heating, cooling and ventilating wall of any desired height to be described in detail, and erected upon a suitable foundation 11 and capped by a beam 12 or the like. The wall 10 has top and bottom courses 13 and 14 formed entirely of ventilating hollow blocks 15, one such block 15 being illustrated in FIGURE 3. Second uppermost and lowermost courses 16 and 17 are constructed entirely of ventilating blocks 18, one of which blocks is depicted by FIGURE 4. The remaining intermediate courses 19 making up the wall 10 and which may vary in number depending upon the height of the wall are all constructed from hollow concrete or like building blocks 20, each have vertical side walls 21, end walls 22, and spaced intermediate vertical webs 23, as shown. It may thus be seen that each block 20 has three separated vertical air passages 24 formed therethrough and opening through the top and bottom faces thereof, each block 20 being closed at its ends and opposite sides. When the blocks 20 are laid

up in staggered relation in the several courses 19, FIGURE 1, free vertical air passages are thus formed through all of the courses 19 by the communicating openings 24 of adjacent courses. The blocks 20 also have V-notches 29' in the tops of their walls 22 and 23, to allow air to pass horizontally through the intermediate courses 19, longitudinally thereof but not transversely.

The blocks 15 of the uppermost and bottom courses 13 and 14 are identical and FIGURE 3 shows one of these blocks inverted for clarity of illustration. Each such block has vertical side and end walls 25 and 26 and intermediate vertical partition walls 27, as shown. Each block 15 is open at its top and bottom and has three separate vertical through passages for air as shown, adapted to communicate with the openings 24 of blocks 20 in the wall structure. The inner side wall 25 of each block 15 is provided at its lower edge, inverted in FIGURE 3, with V-shaped notches 28 communicating laterally with the vertical through passages of the block. The opposite or outer side wall 25 does not have the ventilating notches 28, as this side of the block forms a part of the outer face of the wall structure and is closed to the elements. The partition walls 27 and end walls 26 are similarly provided in their bottom edges with aligned ventilating V-notches 29, allowing air to circulate longitudinally through each block and through the entire courses of the blocks 15 in assembly. Thus, with the construction depicted in FIGURE 3, it is now apparent that air may flow freely through the block vertically and longitudinally and also laterally through one side of the block.

With reference to FIGURE 1, the uppermost course 13 is laid upon the course 16 having the blocks 18, and the several notches 28 and 29 are arranged downwardly upon the inner face of the wall. The vertical through passages of the blocks 15 communicate directly with the similar passages of the other blocks in the wall structure. The open tops of the blocks 15 are closed in assembly by the beam 12.

The lowermost course 14 underlies the course 17 and the blocks 15 thereof similarly have their ventilating notches 28 and 29 facing downwardly as shown. The foundation 11 covers the open bottoms of the blocks of the lowermost course 14. Air may flow longitudinally through the lowermost course 14 via the notches 29 and laterally into and out of the inner sides of the blocks 15 via the notches 28. The vertical passages of the blocks 15 in the lowermost course 14 communicate with the similar vertical passages in all of the blocks thereabove in the composite wall structure so that air may rise or fall vertically through the entire wall structure.

Each block 18 of the two courses 16 and 17 comprises closing side walls 30, foreshortened end walls 31 having V-notches 32 in their top edges and intermediate foreshortened partition walls 33 having V-notches 34 in their top edges. The block 18 in FIGURE 4 is shown upright as it is used in the assembled wall structure. Each block 18 has three vertical through passages between the end walls 31 and partition walls 33. The notches 32 and 34 are in longitudinal alignment.

With reference to FIGURE 1, the blocks 18 of courses 16 and 17 are laid up between the courses 13 and 19 and 14 and 19, as shown with the vertical through passages communicating throughout the wall structure. The notches 32 and 34 permit air to flow longitudinally horizontally through the courses 16 and 17 and there is no lateral flow of air through the blocks of these courses 16 and 17.

A metal heating conduit or pipe 35 adapted to receive any suitable heating medium or fluid extends longitudinally through the course 17 and above the foreshortened walls 31 and 33. The conduit 35 carries a multiplicity of closely spaced rectangular metal heat radiating fins 36

disposed within the confines of the blocks 18 above the walls 31 and 33, as shown. The fins 36 may rest upon the walls 31 and 33 and may be welded to the conduit 35 or otherwise suitably secured thereto in heat conducting relation therewith. The fins 36 cover the major portion of the surface area of the conduit 35 and occupy a substantial portion of the internal space within each block 18 in the vertical through passages thereof, above the notches 32 and 34. Consequently, air arising through the block course 17 flows over and around the conduit 35 and fins 36 and receives heat therefrom, while fresh air may still pass longitudinally through the course 17 via the notches 32 and 34. The rectangular fins 36 conform to the internal shape of the blocks 18 above the tops of walls 31 and 33, FIGURE 2, and substantially fill the upper portions of the blocks and cannot turn therein.

The construction in the second uppermost course 16 is identical to the construction just described for the course 17. The only difference with regard to the course 16 is that the conduit or pipe 35' carries a cooling medium or fluid instead of a heating medium. The conduit 35' is finned at 36' in the manner just described above for the course 17.

During construction and during use in all seasons, the wall is weather-proof on its outer side or face which is entirely closed. The wall is always ventilated because air may enter laterally through the notches 28 and longitudinally through the notches 29 and 32 of the various courses. The air within the wall is free-flowing vertically through all of the courses between the uppermost notches 28 and the lowermost notches 28, FIGURE 1.

In the summer, when cooling of the enclosure is desired, a suitable cooling medium is passed through the conduit 35' and ambient air entering the wall structure at the top thereof through notches 28 will circulate over and through the fins 36', thus cooling the air and causing it naturally to pass downwardly within the wall and ultimately to emit into the enclosure to be cooled through the bottom notches 28, as indicated by the broken line arrows. Any condensation which might be formed adjacent the conduit 35' may be drained from the course 16 to the foundation by suitable means not shown.

When heating is desired, a heating medium is passed through the conduit 35 and air entering the wall through the lowermost notches 28 will circulate through the fins 36 and become heated and will then rise upwardly through the wall structure and exit into the enclosure through the uppermost notches 28 as shown by the full line arrows in FIGURES 1 and 2.

The ventilating, heating or cooling wall structure maintains itself essentially dry at all times because of the free flow of air therethrough. The construction is very simplified, highly compact, neat and clean in appearance and very economical to install. It obviously dispenses with a great deal of expensive equipment which conventionally must be separately installed within or exteriorly of the building and therefore saves much valuable floor space. The construction is ideally suited for factories, garages and other commercial buildings and is also suitable for dwellings including apartment houses, etc. The heating system and the cooling system is identical and interchangeable as to structure, fully enclosed, fire-proof and safe. Other advantages of the invention will be readily apparent to those skilled in the art.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or scope of the subjoined claim.

Having thus described my invention, I claim:

A building wall structure having self-ventilating and heat exchange capabilities comprising substantially identical lowermost and uppermost courses of blocks, each block in said lowermost and uppermost courses having side, end and intermediate walls defining plural vertical air passages through said courses and blocks, one side wall of each block provided in its lower edge with spaced downwardly opening lateral air vents communicating directly with said vertical passages, said end and intermediate walls having in their lower edges longitudinally aligned downwardly opening notches communicating with said vertical air passages and forming through said courses continuous longitudinal horizontal air passages, substantially identical next lowermost and uppermost courses of blocks immediately above and below the first-named courses and engaging the same, each block in the second-named courses having imperforate side walls and end and intermediate walls whose top edges terminate a substantial distance below the tops of the second-named courses to form continuous large rectangular channels through the second-named courses adapted to receive heat exchanger devices, said last-named end and intermediate walls having longitudinally aligned upwardly opening notches therein communicating with the vertical passages and forming through the last-named courses of blocks continuous horizontal longitudinal air passages immediately below said heat exchanger devices, and a plurality of intermediate courses of blocks between said next lowermost and uppermost courses, each block of each intermediate course having imperforate side walls and spaced end and intermediate walls forming vertical air passages through the last-named blocks and courses, the last-named end and intermediate walls having longitudinally aligned upwardly opening notches formed therein to provide in each intermediate course a continuous horizontal longitudinal air passage.

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